

**WHAT IS CLAIMED IS:**

- 1 1. A composition for producing colored synthetic fiber having improved color strength and dimensional stability, the composition comprising:
  - 3 a) at least one fiber-forming polyamide,
  - 4 b) at least one thermoplastic polyester, said thermoplastic polyester being present at a ratio of less than 2:1 by weight with respect to said fiber-forming polyamide and forming a dispersed, non-continuous, minor phase in a matrix of said fiber-forming polyamide,
  - 5 c) a colorant system comprising at least one colorant selected from the group consisting of inorganic pigments, organic pigments, and mixtures of inorganic and
  - 6 organic pigments.
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- 1 2. The composition of claim 1 wherein said colorant system includes at least one carrier resin for said colorant.
- 1 3. The composition of claim 1 wherein said at least one fiber-forming polyamide is selected from the group consisting of polyamide 6, polyamide 11, polyamide 12, polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures thereof.
- 1 4. The composition of claim 1 wherein said at least one fiber-forming polyamide is selected from the group consisting of polyamide 6 and polyamide 6,6.
- 1 5. The composition of claim 1 wherein said at least one thermoplastic polyester is selected from the group consisting of polyalkylene terephthalates, polyalkylene succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or mixtures thereof.
- 1 6. The composition of claim 1 wherein said at least one thermoplastic polyester is selected from the group consisting of poly(ethylene terephthalate), poly(propylene terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures thereof.

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- 1    7. The composition of claim 1 wherein said at least one said thermoplastic polyester  
2    is present at between about 15 weight % and about 35 weight % with respect to the  
3    total weight of the composition.
- 1    8. The composition of claim 1 wherein said at least one colorant is selected from the  
2    group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc ferrites,  
3    sodium alumino sulpho-silicate pigments, carbon blacks, phthalocyanines,  
4    quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and  
5    perylenes.
- 1    9. The composition of claim 8 wherein said colorant is selected from the group  
2    consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide, Ultramarine  
3    Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60, Pigment  
4    Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment Red 177,  
5    Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272, Pigment  
6    Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment Yellow  
7    119, Pigment Yellow 147 and Pigment Yellow 150.
- 1    10. The composition of claim 1 wherein said colorant is present at between about 0.1  
2    weight % and about 8 weight % of the composition.
- 1    11. The composition of claim 2 wherein the at least one carrier resin is selected from  
2    the group consisting of polyamides, polyesters, sulphonated polyesters, and  
3    copolymers, blends and mixtures thereof.
- 1    12. The composition of claim 2 wherein said at least one carrier resin is a metal  
2    sulphonate polyester.
- 1    13. The composition of claim 12 wherein said metal sulphonate polyester is selected  
2    from the group consisting of alkali metal salts of poly(ethylene terephthalate-co-  
3    sulphoisophthalate) and poly(butylene terephthalate-co-sulphoisophthalate), and  
4    blends and mixtures thereof.

- 1        14. The composition of claim 1, further comprising at least one adjuvant.
- 1        15. The composition of claim 14, wherein said at least one adjuvant is selected from  
2        the group consisting of antioxidant, stabiliser, processing aid, antimicrobial, flame-  
3        retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic additive,  
4        lubricant, melt viscosity enhancer, or mixtures thereof.
- 1        16. A composition for producing colored synthetic fiber having improved color  
2        strength and dimensional stability, the composition comprising:  
3              a) at least one fiber-forming polyamide,  
4              b) at least one thermoplastic polyester, said thermoplastic polyester being present  
5              at a ratio of less than 2:1 by weight with respect to said fiber-forming polyamide  
6              and forming a dispersed, non-continuous, minor phase in a matrix of said fiber-  
7              forming polyamide,  
8              c) a colorant system comprising at least one colorant selected from the group  
9              consisting of inorganic pigments, organic pigments, and mixtures of inorganic and  
10             organic pigments,  
11              d) at least one polymeric compatibilising additive.
- 1        17. The composition of claim 16 wherein said colorant system includes at least one  
2        carrier resin for said colorant.
- 1        18. The composition of claim 16 wherein said at least one fiber-forming polyamide is  
2        selected from the group consisting of polyamide 6, polyamide 11, polyamide 12,  
3        polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures  
4        thereof.
- 1        19. The composition of claim 16 wherein said at least one fiber-forming polyamide is  
2        selected from the group consisting of polyamide 6 and polyamide 6,6.
- 1        20. The composition of claim 16 wherein said at least one thermoplastic polyester is  
2        selected from the group consisting of polyalkylene terephthalates, polyalkylene

- 3       succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or  
4       mixtures thereof.
- 1       21. The composition of claim 16 wherein said at least thermoplastic polyester is  
2       selected from the group consisting of poly(ethylene terephthalate), poly(propylene  
3       terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures  
4       thereof.
- 1       22. The composition of claim 16 wherein said at least one thermoplastic polyester is  
2       present at between about 15 weight % and about 35 weight % with respect to the total  
3       weight of the composition.
- 1       23. The composition of claim 16 wherein said at least one polymeric compatibiliser  
2       additive is a metal sulphonate polyester.
- 1       24. The composition of claim 16 wherein said at least one polymeric compatibiliser  
2       additive is selected from the group consisting of alkali metal salts of poly(ethylene  
3       terephthalate-co-sulphoisophthalate) and poly(butylene terephthalate-co-  
4       sulphoisophthalate), and blends and mixtures thereof.
- 1       25. The composition of claim 23 wherein said metal sulphonate polyester is present  
2       between 1 weight % and 25 weight % of the composition.
- 1       26. The composition of claim 23 wherein said metal sulphonate polyester is added in  
2       an amount such that the composition has between about 300 and about 3500 ppm  
3       sulphur.
- 1       27. The composition of claim 16 wherein said at least one colorant is selected from  
2       the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc  
3       ferrites, sodium alumino sulpho-silicate pigments, carbon blacks, phthalocyanines,  
4       quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and  
5       perylene.

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- 1        28. The composition of claim 16 wherein said at least one colorant is selected from  
2        the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,  
3        Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,  
4        Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment  
5        Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,  
6        Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment  
7        Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.
  
- 1        29. The composition of claim 16 wherein said at least one colorant is present at  
2        between about 0.1 weight % and about 8 weight % of the composition.
  
- 1        30. The composition of claim 17 wherein said at least one carrier resin is selected  
2        from the group consisting of polyamides, polyesters, sulphonated polyesters, and  
3        copolymers, blends and mixtures thereof.
  
- 1        31. The composition of claim 17 wherein said at least one carrier resin is a metal  
2        sulphonate polyester.
  
- 1        32. The composition of claim 31 wherein said metal sulphonate polyester is selected  
2        from the group consisting of alkali metal salts of poly(ethylene terephthalate-co-  
3        sulphoisophthalate) and poly(butylene terephthalate-co-sulphoisophthalate), and  
4        blends and mixtures thereof.
  
- 1        33. The composition of claim 16, further comprising at least one adjuvant.
  
- 1        34. The composition of claim 33, wherein said at least one adjuvant is selected from  
2        the group consisting of antioxidant, stabiliser, processing aid, antimicrobial, flame-  
3        retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic additive,  
4        lubricant, melt viscosity enhancer, or mixtures thereof.
  
- 1        35. A process for producing colored synthetic fiber composition, with improved color  
2        strength and dimensional stability, the process comprising:  
3            (1) melt blending:

- 4           a) at least one fiber-forming polyamide,
- 5           b) at least one thermoplastic polyester, said at least one thermoplastic polyester  
6           being present at a ratio of less than 2:1 by weight with respect to said at least one  
7           fiber-forming polyamide and forming a dispersed, non-continuous, minor phase in a  
8           matrix of said at least one fiber-forming polyamide,
- 9           c) a colorant system comprising at least one colorant selected from the group  
10          consisting of inorganic pigments, organic pigments, and mixtures of inorganic and  
11          organic pigments;
- 12           (2) forming said melt blend into filaments; and
- 13           (3) drawing said filaments into fibers.

1       36. A process according to claim 35 wherein said colorant system employed in the  
2       step of melt blending includes at least one carrier resin for said colorant.

1       37. A process according to claim 35 comprising the further step of texturing said  
2       fibers subsequent to drawing said filaments into fibers.

1       38. A process according of claim 35 wherein said at least one fiber-forming polyamide  
2       is selected from the group consisting of polyamide 6, polyamide 11, polyamide 12,  
3       polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers, blends and mixtures  
4       thereof.

1       39. A process according to claim 35 wherein said at least one fiber-forming  
2       polyamide is selected from the group consisting of polyamide 6 and polyamide 6,6.

1       40. A process according to claim 35 wherein said at least one thermoplastic polyester  
2       is selected from the group consisting of polyalkylene terephthalates, polyalkylene  
3       succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or  
4       mixtures thereof.

1       41. A process according to claim 35 wherein said at least one thermoplastic polyester  
2       is selected from the group consisting of poly(ethylene terephthalate), poly(propylene

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3 terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures  
4 thereof.

1 42. A process according to claim 35 wherein said at least one thermoplastic polyester  
2 is present at between about 15 weight % and about 35 weight % with respect to the  
3 total weight of the composition.

1 43. A process according to claim 35 wherein said at least one colorant is selected from  
2 the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc  
3 ferrites, sodium alumino sulpho-silicate pigments, carbon blacks, phthalocyanines,  
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and  
5 perylenes.

1 44. A process according to claim 35 wherein said at least one colorant is selected from  
2 the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,  
3 Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,  
4 Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment  
5 Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,  
6 Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment  
7 Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

1 45. A process according to claim 35 wherein said at least one colorant is present at  
2 between about 0.1 weight % and about 8 weight % of the composition.

1 46. A process according to claim 36 wherein the at least one carrier resin is selected  
2 from the group consisting of polyamides, polyesters, sulphonated polyesters, and  
3 copolymers, blends and mixtures thereof.

1 47. A process according to claim 36 wherein said at least one carrier resin is a metal  
2 sulphonate polyester.

1 48. A process according to claim 47 wherein said metal sulphonate polyester is  
2 selected from the group consisting of alkali metal salts of poly(ethylene terephthalate-

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3       *co-sulphoisophthalate) and poly(butylene terephthalate-*co*-sulphoisophthalate), and*  
4       *blends and mixtures thereof.*

1       49. A process according to claim 35 including the further step of adding at least one  
2       adjuvant.

1       50. A process according to claim 49 wherein said at least one adjuvant is selected  
2       from the group consisting of an antioxidant, stabiliser, processing aid, antimicrobial,  
3       flame-retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic  
4       additive, lubricant, melt viscosity enhancer, or mixtures thereof.

1       51. A process according to claim 35 wherein a draw ratio in said drawing step is from  
2       1.05 to 7.00.

1       52. A process according to claim 35 wherein a draw ratio in said drawing step is from  
2       1.10 to 6.00.

1       53. A fiber made from the process of claim 35.

1       54. A fiber made from the process of claim 37.

1       55. A fiber made from the process of claim 48.

1       56. A fiber made from the process of claim 35 wherein said fiber has a cross-section  
2       selected from the group consisting of round, delta and trilobal.

1       57. A fiber made from the process of claim 37 wherein said fiber has a cross-section  
2       selected from the group consisting of round, delta, and trilobal.

1       58. A fiber made from the process of claim 48 wherein said fiber has a cross-section  
2       selected from the group consisting of round, delta, and trilobal

1       59. A woven, knitted or pile textile article made from the fiber of claim 53.

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- 1        60. A woven, knitted or pile textile article made from the fiber of claim 54.
- 1        61. A woven, knitted or pile textile article made from the fiber of claim 55.
- 1        62. A carpet or floorcovering made from the fiber of claim 53.
- 1        63. A carpet or floorcovering made from the fiber of claim 54.
- 1        64. A carpet or floorcovering made from the fiber of claim 55.
- 1        65. A fiber made from the composition of claim 1.
- 1        66. A fiber made from the composition of claim 13.
- 1        67. A fiber made from the composition of claim 16.
- 1        68. A fiber made from the composition of claim 24.
- 1        69. A process for producing colored synthetic fiber composition, with improved color  
2        strength and dimensional stability, the process comprising:
  - 3            (1) melt blending:
    - 4              a) at least one fiber-forming polyamide,
    - 5              b) at least one thermoplastic polyester, said at least one thermoplastic  
6                polyester being present at a ratio of less than 2:1 by weight with respect  
7                to said at least one fiber-forming polyamide and forming a dispersed,  
8                non-continuous, minor phase in a matrix of said at least one fiber-  
9                forming polyamide,
    - 10             c) a colorant system comprising at least one colorant selected from the  
11                group consisting of inorganic pigments, organic pigments, and  
12                mixtures of inorganic and organic pigments;
    - 13             d) at least one polymeric compatibilising additive;
  - 14            (2) forming said melt blend into filaments; and
  - 15            (3) drawing said filaments into fibers.

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1       70. A process according to claim 69, wherein said colorant system employed in the  
2       step of melt blending includes at least one carrier resin for said colorant.

1       71. A process according to claim 69, comprising the further step of texturing said  
2       fibers subsequent to drawing said filaments into fibers.

1       72. A process according to claim 69, wherein said at least one fiber-forming  
2       polyamide is selected from the group consisting of polyamide 6, polyamide 11,  
3       polyamide 12, polyamide 6,6, polyamide 6,10, polyamide 6,12, and copolymers,  
4       blends and mixtures thereof.

1       73. A process according to claim 69, wherein said at least one fiber-forming  
2       polyamide is selected from the group consisting of polyamide 6 and polyamide 6,6.

1       74. A process according to claim 69, wherein said at least one thermoplastic polyester  
2       is selected from the group consisting of polyalkylene terephthalates, polyalkylene  
3       succinates, polyalkylene adipates, polyhydroxyacids, and copolymers, blends or  
4       mixtures thereof.

1       75. A process according to claim 69, wherein said at least one thermoplastic polyester  
2       is selected from the group consisting of poly(ethylene terephthalate), poly(propylene  
3       terephthalate), poly(butylene terephthalate), and copolymers, blends or mixtures  
4       thereof.

1       76. A process according to claim 69, wherein said at least one thermoplastic polyester  
2       is present at between about 15 weight % and about 35 weight % with respect to the  
3       total weight of the composition.

1       77. A process according to claim 69 wherein said at least one polymeric  
2       compatibiliser additive is a metal sulphonate polyester.

1       78. A process according to claim 69 wherein said at least one polymeric  
2       compatibiliser additive is selected from the group consisting of alkali metal salts of

3 poly(ethylene terephthalate-*co*-sulphoisophthalate) and poly(butylene terephthalate-  
4 *co*-sulphoisophthalate), and blends and mixtures thereof.

1 79. A process according to claim 77 wherein said metal sulphonate copolymer is  
2 present at between about 1 weight % and about 25 weight % of the melt blend.

1 80. A process according to claim 77 wherein said metal sulphonate polyester is added  
2 in an amount such that the melt blend has between about 300 and about 3500 ppm  
3 sulphur.

1 81. A process according to claim 69 wherein said at least one colorant is selected from  
2 the group consisting of metal oxides, mixed metal oxides, metal sulphides, zinc  
3 ferrites, sodium alumino sulpho-silicate pigments, carbon blacks, phthalocyanines,  
4 quinacridones, nickel azo compounds, mono azo colorants, anthraquinones and  
5 perylenes.

1 82. A process according to claim 69 wherein said at least one colorant is selected from  
2 the group consisting of: carbon black, titanium dioxide, zinc sulphide, zinc oxide,  
3 Ultramarine Blue, cobalt aluminates, iron oxides, Pigment Blue 15, Pigment Blue 60,  
4 Pigment Brown 24, Pigment Red 122, Pigment Red 147, Pigment Red 149, Pigment  
5 Red 177, Pigment Red 178, Pigment Red 179, Pigment Red 202, Pigment Red 272,  
6 Pigment Violet 19, Pigment Violet 29, Pigment Green 7, Pigment Green 36, Pigment  
7 Yellow 119, Pigment Yellow 147 and Pigment Yellow 150.

1 83. A process according to claim 69 wherein said at least one colorant is present at  
2 between about 0.1 weight % and about 8 weight % of the composition.

1 84. A process according to claim 70 wherein the at least one carrier resin is selected  
2 from the group consisting of polyamides, polyesters, sulphonated polyesters, and  
3 copolymers, blends and mixtures thereof.

1 85. A process according to claim 70 wherein said at least one carrier resin is a metal  
2 sulphonate polyester.

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- 4       86. A process according to claim 85 wherein said metal sulphonate polyester is  
5       selected from the group consisting of alkali metal salts of poly(ethylene terephthalate-  
6       co-sulphoisophthalate) and poly(butylene terephthalate-co-sulphoisophthalate), and  
7       blends and mixtures thereof.
- 1       87. A process according to claim 69 including the further step of adding at least one  
2       adjuvant.
- 1       88. A process according to claim 87 wherein said at least one adjuvant is selected  
2       from the group consisting of an antioxidant, stabiliser, processing aid, antimicrobial,  
3       flame-retardant, antiozonant, soilproofing agent, stainproofing agent, antistatic  
4       additive, lubricant, melt viscosity enhancer, or mixtures thereof.
- 1       89. A process according to claim 69 wherein a draw ratio in said drawing step is from  
2       1.05 to 7.00.
- 1       90. A process according to claim 69 wherein a draw ratio in said drawing step is from  
2       1.10 to 6.00.
- 1       91. A process according to claim 69 wherein a draw ratio in said drawing step is from  
2       1.05 to 7.00.
- 1       92. A process according to claim 69 wherein a draw ratio in said drawing step is from  
2       1.10 to 6.00.
- 1       93. A fiber made from the process of claim 69.
- 1       94. A fiber made from the process of claim 71.
- 1       95. A fiber made from the process of claim 86.

1       96. A fiber made from the process of claim 69 wherein said fiber has a cross-section  
2       selected from the group consisting of round, delta and trilobal.

1       97. A fiber made from the process of claim 71 wherein said fiber has a cross-section  
2       selected from the group consisting of round, delta, and trilobal.

1       98. A fiber made from the process of claim 86 wherein said fiber has a cross-section  
2       selected from the group consisting of round, delta, and trilobal.

1       99. A woven, knitted or pile textile article made from the fiber of claim 93.

1       100. A woven, knitted or pile textile article made from the fiber of claim 94.

1       101. A woven, knitted or pile textile article made from the fiber of claim 95.

1       102. A carpet or floorcovering made from the fiber of claim 93.

1       103. A carpet or floorcovering made from the fiber of claim 94.

1       104. A carpet or floorcovering made from the fiber of claim 95.

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